Joint MPH Program

University of Gondar and Addis Continental Institute of Public Health

Prevalence and factors affecting work-place injuries in Bahir Dar textile factory, Amhara regional state, North West Ethiopia

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Approved by the Examining Board

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1 - Acronyms

ANRS -Amhara National Regional State

BDTF Bahir Dar Textile Factory

ILO International Labor Organization

OHS Occupational Health Service)

OSHA Occupational Safety and Health Administration

W HO World Health Organization)

PPD Personal Protective Device

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Abstract

Background: Work related injuries have become major public health problem drowning much of public and governments attention. Studying the prevalence and determinants of injuries will help planners and decision makers at every level in planning, managing and allocating the scarce resources they have.

Objective: This study tried to assess prevalence of work related injuries and their determinants in Bahir Dar textile factory.

Methodology:

Institution based cross-sectional study was conducted from first –to second week of September, 2010 in Bahir Dar Textile Factory ,Bahir Dar. Study subjects were selected among 1240 workers who were directly involved in production processes by systemic random sampling using the payroll list by proportional allocation from all departments. Data was collected using pretested questionnaire guided face to face interview by six final year nursing students. Supervision was done by the principal investigator and one Bsc nurse. Work environment observation, physical examination, and reviewing injury records were also employed to complement self reported information. Statistical analysis was done using epi-info version 3.5.1 for data entry and cleaning, and SPSS 15 for descriptive and logistic regression analysis.

Results:

The overall occupational injury prevalence rate was 139 per1000 exposed workers per Year. Among 47 injured workers, 22(46.9%) were hospitalized for more than 24 hours. A total of 659 working days were lost making the average working days lost per injured worker 14 days .No death was reported during the study period. Low monthly income, and working in weaving and spinning departments were associated with workplace injuries (AOR: 2.49 (1.16, 5.36) and (AOR: 0.34 95 % CI (0.13, 0.87) respectively.

Conclusion and recommendation:

Low monthly-income and working in weaving and spinning department were found to be determinants of injury. Reasonable payment and comprehensive occupational health and safety activities are recommended to solve the problem.

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Keywords*: Occupational injuries, magnitude, determinants, and Bahir Dar Textile Factory*

1. Introduction

Making working conditions safe and healthy is the interest of workers, employers and the Government. Although it seems simple and obvious, this idea has not yet gained meaningful recognition in many parts of the world where more than half of the population is economically active. The health of workers is determined by a number of occupational hazards, individual risk factors and access to health services, which are modified by social factors and employment conditions. Although highly effective occupational health interventions exist, less than 15% of the global workforces, primarily in big enterprises in developed countries, have some access to occupational health services. Workers with precarious jobs, unemployed, migrants and those in informal economy and agriculture often do not have access to any preventive or curative health care (1, 2).

The ILO firmly believes that work-related accidents and ill-health can and indeed must be prevented and that action is needed at international, regional, national and enterprise levels to achieve this. Prevention involves management, foresight, planning and commitment - to anticipate hazards, assess risks and take action before an accident happens or an illness has been contracted. Both the human and the economic costs of accidents and ill-health at work worldwide are enormous. It has been estimated, for example, that the loss in global Gross Domestic Product resulting from deaths, injuries and illness at work is some 20 times greater than all official development assistance. However, while the economic costs are very great, the human cost of such suffering is incalculable. According to ILO 2005 report out of 2,836,897,404 economically active populations 9,031431 accidents were reported among which 41,748 were fatal. In the SSA including Ethiopia from a total of 279,680,390 economically active populations 27,015 were reported to have accidents with 145 fatal cases (This could be secondary to under reporting—ILO expected 53,292). There are annually at least 60 000 fatal accidents on construction sites around the world, according to ILO estimates. (3) In another ILO report office estimated that for global work accidents among workers, about 200,000 persons die annually and 120 million are injured or become ill. Fatality rates are alarmingly high in some developing countries in Asia, being several times higher than those of industrialized countries, about 30 to 43per 100,000 workers .In many countries of Asia and the Pacific, where the number of workers injured varies depending upon national reporting procedures, accident rates were generally between 20 and 40 per 1,000 workers.(4) A six-month (June 1999 and June 2000) longitudinal incidence study was carried out at the Central Hospital, Benin City, Nigeria .Results shows that contact with patients' blood with ungloved hands, blood splashes on the face an d other parts of the body, needle pricks, cuts from drug ampoules and glove perforation during surgery were the major work-related accidents/injuries during the six-month follow-up. Combining all the health workers, the incidence densities of these five major work-related accidents were between 3.6 per person years (ppy) to 9.5ppy. (5). Occupational safety and health (OSH) interventions are designed to minimize

workers' exposures to job-related risks, including exposures to physical, biological, chemical, ergonomic and psychosocial hazards .These interventions may include changes in the organization and environment, such as the use of product substitution, engineering controls, and job re-design, as well as through individual efforts, including use of personal protective equipment, generally seen as a supplemental measure. These interventions are predominantly within the domain of management decisions, rather than of individual worker actions, and may also be the subject of joint decision-making by labor and management through collective bargaining or less formal means.

The development of policies and programs for prevention and control of occupational risks is essential to protect the workers' health. However, information describing the workers' health conditions should be gathered to know the occupational health priorities of a country and to assess the impact of prevention policies and programs on the population at risk (6, 7) .In Ethiopia, even though there are no extensive research studies done, from what is available so far we can learn that workplace injuries are becoming major public health problems consuming huge amount of resources

Moreover, due to the rapidly growing number of small, medium and large scale industries in all corners of the country studies in the field of OHS, prevalence and determinants of workplace injuries will become critically essential .So that, properly, timely and scientifically conducted studies will definitely help planners and policy makers in designing appropriate preventive strategic measures

3 .Rationale of the study

Despite the rapid advancement of technology and globalization many people, particularly in developing countries, are working under unsafe conditions that pose injury and death. In addition, the economic costs of occupational injuries are also responsible for more lost time from work, reduce productivity and decrease working years of life. Well organized Information and documentation on occupational health and safety services is helpful in raising awareness at all levels and making the problem of injuries more visible to policy makers and managers. However, in most developing countries like Ethiopia there is no systematized recording and reporting of occupational injuries. Data on injury at national level is also inadequate. In general the assessment made on occupational injuries among workers is useful in the development of injury prevention strategy so that morbidity, disability and death among workers due to occupational injury are minimized and promote production opportunity. Besides, it can also serve as base line information to undertake studies on similar settings, and findings from this study may contribute some and complement the existing knowledge about work related injury

4. Literature review

4. 1 occupational health and safety (OHS)

Hundreds of millions of people throughout the world are working today under circumstances that foster ill health and/or are unsafe. It is estimated that yearly over two million people worldwide die of occupational injuries and work-related diseases, and the WHO's World Health Report, 2002, indicates that 1.5%of the global burden in terms of disability-adjusted life years (DALYs) result from only a selected subset of occupational risks. Occupational health and safety is a discipline with a broad scope involving many specialized fields aiming at different stages of the production process. . (8, 9)

The development of policies and programs for prevention and control of occupational risks is essential to protect the workers' health. However, information describing the workers' health conditions should be gathered to know the occupational health priorities of a country and to assess the impact of prevention policies and programs on the population at risk. (10, 11, 12, 13)

Occupational safety and health (OSH) interventions are designed to minimize workers' exposures to job-related risks, including exposures to physical, biological, chemical, ergonomic and psychosocial hazards. These interventions may include changes in the organization and environment, such as the use of product substitution, engineering controls, and job re-design, as well as through individual efforts, including use of personal protective equipment, generally seen as a supplemental measure. (6, 14)

4.2. Magnitude and burden of occupational injuries

Many people are at risk of ill health and accidents because of the conditions they encounter in their workplaces .Combating these dangers require a multidisciplinary approach and special attention to the elimination of hazards from the work environment. (9, 11) At present rapid changes in working life are affecting both the health of workers and the environment. This is particularly the case of the African Region where the introduction of new technologies, new chemical substances and materials have led to new occupational and work-related diseases and injuries, while the traditional hazards, such as high dust or noise levels in the workplace, have not been dealt with adequately. This leads to an increased burden of occupational diseases and injuries (15)

Despite the poor recording and reporting systems ILO estimates that 2 million workers die each year from work-related injury and illness. In the2002 World Health Report, WHO concluded that workplace hazards are responsible globally for 37% of back pain,16% of hearing loss, 13% of COPD,11% of asthma, 10% of injuries, 10%of lung cancer, and 2% of

leukemia. In 2002, in Sub-Saharan Africa alone, ILO estimates more than 257 000 total work-related fatalities, including about55 000injuries. Study done by James Leigh,1 Petra Macaskill et al, present aggregate results and analyses by region and disease estimate that approximately 100,000,000 occupational injuries (100,000 deaths) and 11,000,000 occupational diseases (700,000 deaths) 'occur in the world each year(8). A study of mortality in Nigerian factories over a 10 year between 1987 and 1996, a total of 3183 injuries were reported, of which 71 (2.2%) were fatal. The annual case fatality rate ranged from 0.94 per 100 injured workers in 1990 to 5.41 in 1994, with an overall fatality rate of 2.23 per 100 injured workers (16)

In Ethiopia, a study done in North Gondar zone, Amhara Regional State, prevalence of work related injuries among small and medium scale industrial workers, revealed that annual prevalence rate of work related injury was 335/1000 exposed workers, with 355/1000 and 324/1000 among small and medium sale industrial workers, respectively. Another study done in Tendaho Agricultural Development sc, Afar Regional State the overall occupational injury prevalence rate was 783 per1000 exposed workers per year. (14, 17, 18)

4.3 common occupational injuries, causes and parts of the body affected

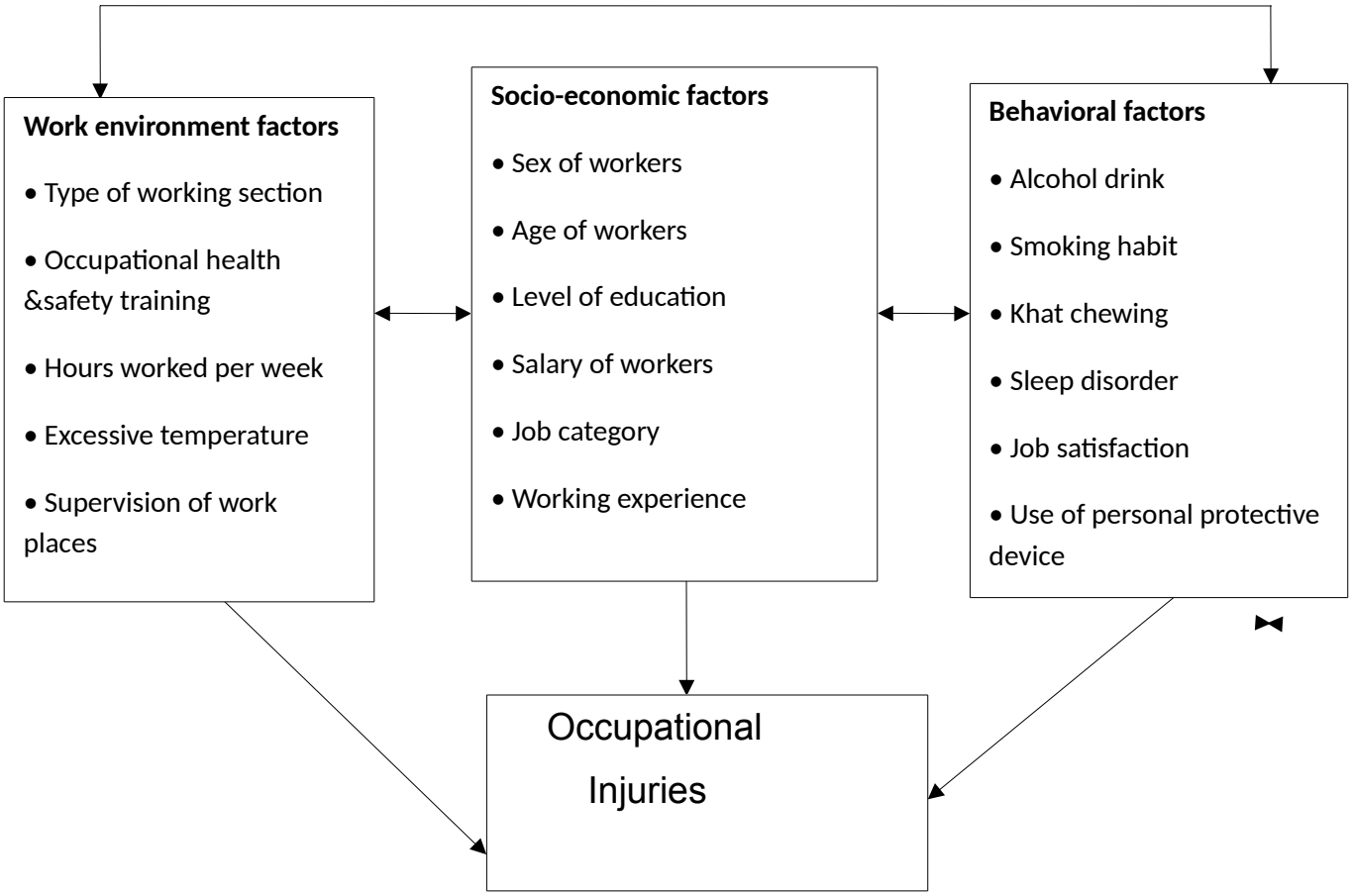
There are an unlimited number of hazards that can be found in almost any workplace. There are obvious unsafe working conditions, such as unguarded machinery, slippery floors or inadequate fire precautions, but there are also a number of categories of insidious hazards including chemical hazards, physical hazards biological hazards, psychological hazards .(4.9,)

A study done in North Gondar , North East Ethiopia revealed, the causes for work related injury were highly variable, but the most common agent stated as cause were machinery 88(23.9%), Splinters 80 (21.7%) and hand tools 61(16.6%) (11).The body parts affected were Hand 126 (30.0%), Finger 99 (23.6%) Eye 81 (19.3%), Toe 26 (6.2%) and Back 19 (4.5%). Similar study done in Tendaho Agricultural Development s.c predominantly affected parts of the body were Finger 306(32.0%), lower leg 195(20.4%), eyes 117(12.2%), toes 104(10.9%), and lower arm100(10.4%). Laceration 370(36.9%), cuts1 16(11.6%), puncture 109(10.8%), eye injury 109(10.8%), crushing 103(10.2%) and heat strain 60(6.0%) were commonly seen injury type. Regarding causes of injury, majority, 457(53.6%), of injuries were caused by hand tools, 95(11.2%) by splinting /splashing objects, 77(9.0%) were falling accident, 68(8.0%) were hit by falling objects and 44(5.2%) were by lifting heavy objects. (14, 17)

4.4 Factors related to work related injuries

In most developing countries workplaces are unsafe, inconvenient and below the standard making workers prone to accident. Most studies have found that young age, lack of experience, job dissatisfaction, sleep disorders, substance use and lack of physical activity are highly associated with work place injuries (9, 12, 19, 20, and 21). The consistently high fatal accident rate in developing countries emphasizes the need for occupational health and safety education programmes that focus on prevention. (9)Study done in Kuwait on Detrimental Effects of Variable Work Shifts on Quality of Sleep, General Health and Work Performance, results suggest that the majority of workers on an 8-hour variable-shift schedule experienced various health problems, poor quality of sleep and an increased risk for errors and accidents at work as compared with those workers on a straight daytime shift schedule. There is a need to compare potential benefits of an alternative work shift schedule. (22)A case referent study in Sweden indicates that shift work is associated with myocardial infarction in both men and women. The mechanism is unclear, but the relation cannot be explained by job strain, smoking, or job education level. (23) Cumulative job stress is common and is associated with increased risk of mental health disorders and psychotropic drug use The volume of services provided and job dissatisfaction are associated with hypnotic and tranquillizer use(24)Young age, job category, lack of experience, and sleep disorders increased the risk of work related injuries. Working 48 hours or less, workplace supervision, and job satisfaction decreased the occurrence of work related injuries. Working more than 48 hours per week absence of health and safety training sleeping disorder, alcohol drink job dissatisfaction and absence of protective devices were significant factors to occupational injuries. (17, 19, 21, 25).In general understanding and implementation of OHS is essential in the prevention of occupational injuries and maintaining conducive working environment

Figure1: Conceptual framework for the study of the magnitude and factors related to occupational injuries.



5. Objective

5 .1 General: - To assess the prevalence and determinant factors related with work place injuries

5.2 Specific

To assess the prevalence of workplace injuries

-To determine determinant factors associated with work-related accidents

6. Methodology:

6.1 Study area: This study was conducted in Bahir Dar Textile Factory (BDTF), Bahir Dar town, the capital city of ANRS, located 565 Km North West of Addis Ababa Bahir Dar is situated on the southern shore of Lake Tana, the source of the Blue Nile (or *Abay*), having an elevation of 1840 meters above sea level. .Administratively the town is divided in to17 Kebeles and has a total population of 289,344 including recently added 12 Kebeles (2007-05-28 census). Bahir Dar is one of the leading tourist destinations in Ethiopia with a variety of attractions in the nearby Lake Tana and Blue Nile river. In this fastly growing city there is one referral Hospital ,one university (Bahir Dar university) more than 7 private colleges . In addition to BDTF there other factories (oil factory, plastic factory). The factory is situated along the course of the famous river Abay. This government owned factory, BDTF, was established in 1962 (1954 Ec) by reparation from the Government of Italy with initial capital worse of 9 million Eth birr. At present the factory runs more than 107 million Birr capital enrolling 1224 workers. It produces wide range of textile products for export and domestic use. Health services, (preventive promotive and curative), free of charge is provided to the worker round the clock. This medium clinic is run by a physician and other paramedical staffs.

6.2 Study design: Institution based cross-sectional quantitative study was conducted in Bahir Dar Textile Factory.

6. 3 Study population

6.3.1 .Source population: all permanent employees of Bahir Dar Textile Factory

6.3.2 Inclusion criteria: All employees in Bahir Dar textile factory who are directly involved in the production processes

6.3.3 - Exclusion criteria: Temporary employees, those employees who were ill during the data collection period.

6.3.4 Sample size determination:

Sample size was determined using single population proportion formula: To maximize the sample size prevalence of 50% and marginal error (d) of 0.05 and 95% confidentiality was assumed. To compensate for non-response due to refusal or incompleteness, 10% was added. Since the total employees in the factory were about 1224, correction factor was used, and accordingly a total of 340 employees were needed.

The following formula was used:

$$n_i = \frac{(Z\alpha/2)^2 P(1-P)}{d^2}, \frac{(1.96)^2 0.5(1-0.5)}{(0.05)^2} = 385$$

$$ni = 385$$

Where: ni: Sample size calculated from infinite population.

n f: Total sample size to be studied.

N: Source population (1224 workers).

Z/2: A standard Z score 1.96 corresponding to 95% confidence

Correction factor formula used:

$$Nf = \frac{ni}{1+(ni/N)} = \frac{385}{1+(385/1224)} = 293$$

Total sample size = Nf +10% (non response rate 293)

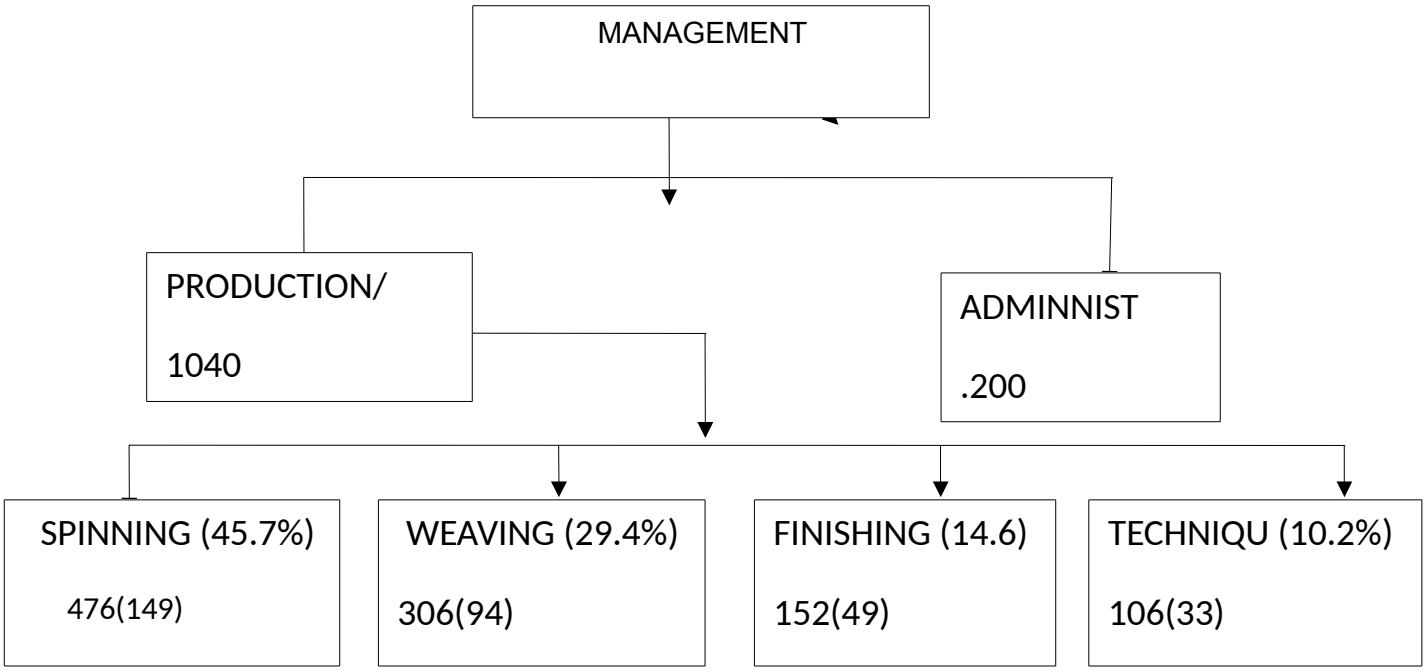
293+30= 323

NB*Due to readjustment of the workforce 17 people were shifted to the production department which has increased the total sample size to 340

6.4 Sampling procedure:

The study stratified the factory workers into four production departments. In each production department's payroll was used as a sampling frame, and the sample size in each study departments was determined by proportion to population size. Within each department the total number of workers was divided by allocated sample size to determine the sampling interval which was three. In each department the first person from the sampling interval (1-3) was selected using simple random sampling using lottery method, and the next study subjects were selected by adding the sample interval until the total sample size for that department is picked

Figure2. Schematic representation of proportional allocation of workers by department



NB -Due to transfer of manpower some changes took place in the number of workers in each department

6.7 Data collection procedures:

Primary data was collected in the premises of the factory during the normal working hours (8.00AM to 5.00 PM) using questionnaire guided face to face interview conducted by six final year Nursing students from ALKAN Health teaching College, Bahir Dar . To secure the quality of data the English version questionnaire was translated in to Amharic version and back to English. Training was given by the investigator using lecture notes and role play, for two day on the, objectives of the study, methodology, roles and duties of data collectors, how to get the respondent, interviewing skills and ethical considerations. In addition to this they had a chance of half a day visit in the factory with briefings about the production process which gave them insight about nature of the textile factory. Pre-test was conducted among interviewers and piloting was done on 10% (32 randomly selected workers) from oil factory in Bahir Dar town. The supervisor (Bsc Nurse) from DBTF Clinic and data collectors have gone through each questionnaire daily for its reliability completeness and consistency. Five percent of the collected data was checked by the principal investigator for the accuracy and completeness of data collection

Data collection tools used was:

1 -Structured and pre-tested questionnaire

2 -Checklist for observation of the working environment,

3-Physical examination of the injured workers and

4-Review of injury records from the clinic and/or safety officer

6.8 Operational definition

-**Occupational injury**: any personal injury, disease or death resulting from an accident in the course of work.

-Severity of injury: characterized by death, hospitalization more than 24 hours and absence from work over three days in the last one year.

-**Excessive heat**: heat is recorded as excessive, if a worker is found sweating when naked or with light clothing; (if the investigator feels a sudden heat wave when entering to the work place)

-Excessive noise: noise that makes it difficult to communicate among neighbor workers without shouting at a distance of about one meter.

6.9 Data management and analysis:

Data was entered and analyzed using Epi-Info version 3.5.1, and SPSS statistical package, version 15.0. Descriptive statistics of the collected data was done for most variables in the study using standard statistical parameters: percentages, means and standard deviations. Crude odds ratios with 95 % confidence interval were used to measure the association of dependent and independent variables. Adjusted odds ratios with 95% confidence intervals were calculated for each of independent variables in stepwise forward binary logistic regression model with self-reported work-related injury as the primary dependent variable to assess the determinants.

6.10 Study variables

6.10.1- Dependent variable: workplace- injuries.

6.10 2- Independent variables:

-Socio demographic variables: Sex, age, religion, educational level, marital Status, monthly salary, working experience, job category, area of residence.

-Work environment variables: Hours worked per week, workplace supervision, Health and safety training

-Behavioral variable: Alcoholic drink consumption, chat chewing, sleep disorder, Job satisfaction and use of Personal protective equipment.

6.11 Ethical consideration

Ethical clearance and permission was obtained from the ethical committee of Addis Continental Institute of Public Health and University of Gondar. Support letter was produced from Amhara National Regional State, Health Bureau .The study participants were informed about the purpose of the study and the importance of their participation in the study. The study subjects were informed that any information they provided us will be kept confidential and they can decline any questions that they do not want to answer.

7. Result

7.1 Socio-demographic characteristics of respondent:

Of the total 340 expected respondents in the study 338 completed the questionnaire making the response rate of 99.4%. All respondents were urban dwellers, 331(97.9%) Amhara, 328(97%) Orthodox, and 194(57.4%) married. Fifty-five percent (186) of the respondents were male, 45% (152) females with male to female sex ratio of 1.2:1. Age ranges from 18 to 59, with mean of 32.7 (±SD of 10.9) and 159 (47%) of the respondents were found between 14 to 29 years of age. Majority of the respondents, 134(39.6%), have attended secondary school. The mean salary was fond to be 623(SD 302) .Service year ranging 1 to37 (mean 11.01. Majority of the workers, 158(46.7%) come from the spinning department (Table 1)

7.2. Characteristics of work-related injuries

Out of the total respondents only 47(13.9%) had encountered work -place injuries in the last 12 months which makes the overall occupational injury prevalence of 139 per 1000 exposed workers per year. Five, (1.5%), of the injured respondents sustained more than one injury .Frequently affected body parts were fingers 26(59.1%),back 7(15.9&) and head and eyes each 3(6.8%) respectively. Abrasion 14 (31.1%) and cut (28.9%) were the leading types of injury. Most injured workers claimed, machine, 21(45.6%), to be the leading cause for injury. Absence of Personal Protective Device (PPD) was mentioned to be the reason for the injury in 24(52.2%) of cases .Forty-seven (81.4%) of the total injuries happened on Monday 13(27.7%), Tuesday 13(27.7%) and Wednesday 9(12.8%) of the week and 23(50%) in the morning time of the day. (Table 2 &3)

7.3 Severity of work-related injuries

Among 46 injured workers, 21(44.7%) were hospitalized for less than24 hours and 22(46.9%) for more than 24 hours respectively. Working hours lost ranges from1 to 90 days. Including the, four, non hospitalized workers, a total of 659 working days was lost making the average working days lost per injured 14. Death was not reported during the study period.

Table 1: Socio-demographic characteristics of the study subjects of Textile factory Workers, Bahir Dar Ethiopia, Sept-2010

Characteristics	Frequency (n=338)	Percent
Sex		
Female	153	45.3
Male	185	54.7
Age		
15-29	159	47.0
30-44	106	31.4
45 +	73	21.6
Mean ± SD	32.7 ± 10.9	
Educational status		
Primary < 8 Grade	108	32.0
Secondary 8-10	134	39.6
Tech/Diplo/Collage	96	28.4
Marital **Status**		
Married	196	58.0
Unmarried/ Divor/ Widow	142	42.0
Work Department		
Spinning	158	46.7
Weaving	96	28.4
Finishing	51	15.1
Technique	33	9.8
Service Year		
< 5 years	127	37.6
5 + years	211	62.4
Monthly Income		
< 500 Birr	51	15.1
500 + Birr	287	84.9

Table 2: Distribution of work related injury by body parts, injury type, reported cause, And time of incidence in the last 12 months of the study subjects of Textile Factory workers, Bahir Dar Ethiopia, Sep-2010

Characteristics	Frequency	Percent
Body part affected (n=44)		
Finger	26	59.1
Back	7	15.9
Head	3	6.8
Eyes	3	6.8
Multiple	3	6.8
Lower leg	1	2.3
Tooth	1	2.3
Injury by type (n=45)		
Abrasion	14	31.1
Cut	13	28.9
Dislocation	7	15.6
Puncture	5	11.1
Fracture	3	6.7
Amputation	1	2.2
Eye injury	1	2.2
Electrocution	1	2.2
Reported cause (n=46)		
Machine	21	45.6
Lifting heavy objects	7	15.2
Hit by falling object	6	13.0
Splintering object	6	13.0
Hand tools	4	8.7
Falls	1	2.2
Collision	1	2.2
time within a day (n=46)		
Morning	23	50.0
Afternoon	16	34.8
Evening	6	13.0
Mid-night	1	2.2
Time of the day (n=46)		
Monday	13	28.3
Tuesday	13	28.3
Wednesday	11	23.9
Thursday	8	17.4
Saturday	1	2.2

7.4 Work environment and behavioral characteristics of respondents.

Most respondents 300(88.8%) worked 48 hours and above per week. Two hundred (60.4%) reported taking safety training and 334(98.8%) have witnessed work-place supervision. Chat chewing and cigarette smoking was negligible. Alcohol drinking and sleeping disorder was reported in 89(26.3%) and (13.6%) respectively. The leading causes of sleep disorder were work over-load 20(43.5%) and night shift16 (34.8%), respectively. Two hundred- fifty three (74.9%) were satisfied with their job. Personal protective devices, were used by 55(16.3%) of the respondents and most frequently used were gloves29 (63%), and goggls14 (30%) respectively (Table 2 &3).

Table 3 Work environment and behavioral characteristics of respondents, in Bahir Dar Textile Factory Bahir Dar Ethiopia Sept-2010

Work environment	Frequency	Percent
Hours worked per week		
Less than 48 Hours	31	9.2
48 hours or more	307	90.8
Workplace supervision		
Yes	334	98.8
No	4	1.2
Health and Safety training		
Yes	201	59.5
No	137	40.5
Alcohol Drinking habit		
Yes	89	26.3
No	249	73.7
Chat chewing habit		
Yes	10	3.0
No	328	97.0
Sleeping while working		
Yes	46	13.6
No	291	86.4
Use PPE		
Yes	55	16.3%
No	283	83.4%
Job satisfaction		
Yes	253	16.3
No	85	83.7

7.5 Work environment observation

Checklist guided work-place observation revealed that there is safety committee which is led by administration department .It has no regular meeting program. Workers get their safety training only at the time of employment. In most of the working places illumination was deem, noise level was high, rugged non smooth floor exposing to fall .In some sections machines were not safe guarded. Nearly all didn't use personal protective devices. Even though the clinic is in the campus first aid kits were not available in each work areas. Encouragingly, fire extinguishers are available in all corners of the factory. There was no excessive heat. Adequate latrine and washing rooms are available. Warning signs and labeling are missing in many parts the work areas.

8. Bivariate Analysis for Socio demographic, work environment and behavioral determinants

8.1: Socio demographic, work environment and behavioral determinants

Cross tabulation followed by binary logistic regression was done between acquiring work-place injury as a dependent variable against the four groups of independent variables, socio-demographic, work environment injury characteristics and workers behavior. Only monthly income of study subjects and department of work place revealed to have significant association at $P < 0.03$ and $P < 0.05$, respectively. However, in this study other variables like sex, age, educational status, marital status, alcohol drinking habit, sleeping while working did not show any significant relation (Table 5&6).

Table 4: Association of socio-demographic factors by work-related injury in Bahir Dar Textile Factory, Bahir Dar Ethiopia Sept-2010

Variable	Injury in 12 months		C OR (95%)
	Yes	No	
Sex			
Female	29	156	1.39(0.74,2.62)
Male	18	135	1.00
Age			
15-29	17	142	0.67 (0.30,1.52)
30-44	19	87	1.23 (0.55,2.77)
45+	11	62	1.00
Education			
Primary school	13	95	0.73 (0.33, 1.64)
Secondary	19	115	0.89 (0.42, 1.87)
Tech/college	15	81	1.00
Marital status			
Married	30	166	1.37 (0.71, 2.51)
Unmarried/widow /divorced	17	125	1.00
Dept. of work			
Spinning	19	139	0.42 (0.16, 1.09)
Weaving	10	86	0.35 (0.12, 1.00)
Finishing	10	41	0.82 (0.28, 2.38)
Technique	8	25	1.00
Service year			
<5 years	8	39	1.32 (0.57, 3.04)
5+ years	39	252	1.00
Salary			
<500 Birr	12	39	2.22 (1.06,4.63)*
500+ Birr	35	252	1.00

*=statistically significant

Table5. Relationship between work environment and behavioral characteristics against work-related injury in Bahir Dar Textile Factory, Bahir Dar Ethiopia Sept-2010

Variable	Injury in 12 months		C OR (95%)
	Yes	No	
Hours worked per week			
Less than 48 Hours	11(28.9%)	27(71.1%)	1.12 (0.82, 1.52)
48 hours or more	34(11.3%)	266(88.7%)	1.0
Workplace supervision			
Yes	44(13.2%)	289(86.8%)	0.16 (0.02, 1.13)
No	1(33.3%)	2(66.7%)	1.0
Health and Safety training			
No	15(11.1%)	120(88.9%)	0.80(0.42,1.53)
Yes	30(14.9%)	171(85.1%)	1.0
Alcohol Drinking habit			
No	35(14.1%)	213(85.9%)	1.2(0.518,1.53)
Yes	10(11.4%)	78(88.6%)	1.00
Khat chewing habit			
No	0	10(100%)	0.81 (0.38, 1.73)
Yes	45(13.8%)	281(86.2%)	1.00
Sleeping while working			
No	42 (8.7%)	42 (91.3%)	0.58 (0.20, 1.70)
Yes	42 (12.4%)	249 (85.6%)	1.00
Use PPE			
No	7 (12.7%)	48 (87.3%)	1.07 (0.45, 2.54)
Yes	38 (11.7%)	243 (88.3%)	1.00
Job satisfaction			
No	35 (13.9%)	217 (86.1%)	1.19 (0.56, 2.53)
Yes	10 (11.95)	74 (88.1%)	1.00

Further including variables that were associated with the dependent variable and variables that were borderline associated (P value < 0.2) were included in the model. Workers having a salary less than 500 Birr were more likely to sustain work-place injury than study subjects having 500 Birr or more (AOR = 2.22; 95 % CI; 1.06, 4.63). Similarly, the likelihood of sustaining work place injury was statistically lower among employees who work in Spinning (AOR= 0.34; 95% CI; 0.13, 0.87 and Weaving (AOR= 0.26; 95% CI; 0.09, 0.77) departments than those who work in technique department (Table 6).

Table 6: comparison of socio demographic, work environment and behavioral factors on the prevalence o f work related injuries Ethiopia, Sept-2010

Characteristics	Crude OR (95 % CI)	Adjusted** OR (95 % CI)
Dept. of work		
Spinning	0.42 (0.16, 1.09)	**0.34 (0.13, 0.87)**
Weaving	0.35 (0.12, 1.00)	**0.26 (0.09, 0.77)**
Finishing	0.82 (0.28, 2.38)	0.47 (0.15, 1.45)
Technique	1.00	1.00
Income		
<500 Birr	2.42 (1.15,5.10)	**2.49 (1.16, 5.36)**
500+ Birr	1.00	

** After adjusting for salary and department of work

9: Discussions

Understanding the determinants of work-related injuries is critical to the implementation of safe and productive work practices. In order to develop an injury prevention policy and strategy at workplaces good knowledge about the magnitude and determinants of workplace injuries is highly essential. In line with the above justification this cross-sectional study tried to assesses the prevalence of work-place injuries and their determinants during the last 12 months in Bahir Dar Textile Factory (BDTF) Bahir Dar,

Amhara Regional State, Ethiopia . The overall prevalence rate of work-place injuries was 139 per 1000 exposed workers in the last 12 months. This result showed low prevalence as compared to studies done in Gondar among small and medium scale industries and Tendaho Agricultural Development Farm (335 and ,783 per1000 exposed workers) respectively (13,16). Similar studies done in Addis Ababa and Akaki have also revealed higher prevalence, except one study in Addis Ababa with prevalence of 80 per 1000 exposed workers (33, 34) .The low prevalence in our case could be from low exposure time due to lose of 60(20% of the fiscal years working days) working days by electric power interruption. Another possible reason could be healthy-worker survivor effect after BPR (Business Process Reengineering), measures taken by the management group which pensioned about 520 workers during the last 2 years. In addition to the above reasons, relatively low level of alcohol consumption (26.3%), low frequency of chat chewing (3%) and sleep disorder (13.6%) with high level of job satisfaction (74.9%) and work-place supervision (98.8%) might have contributed for the low prevalence. Last but not least, recall-bias could be considered as a contributing factor because some respondents forget some minor injuries. Similarly the 2-weeks prevalence was low 14 per 1000 exposed workers. The difference might be due to the difference in the time of study and the difference in the type undertakings. .Among the socio-demographic variables age at the time study, sex, educational status and marital status didn't show statistical association with workplace injuries. .

Unlike to other socio-demographic factors monthly income of workers was significantly associated with workplace injuries. Those who earn less than 500 Birr were 2.2 times more exposed to injury than those who earn 500 and above .The likelihood of sustaining work place injury was statistically lower among employees who work in spinning and weaving departments than those who work in technique department where there is high work load and proneness to injury (This departments, includes workers from welding electric workshop, maintenance from all departments, metal work and foundry.)

Those who earn <500 Birr per month were more likely to be engaged in extra activities to get more money to support their family. During this course of action they get exhausted and become prone for injury.

This study has revealed that fingers 26 (59.1%), followed by back of the body 7 (15.9%) and head and eyes each 3 (6.8%) were commonly affected parts of the body. The possible reason for fingers to be injured is by the very nature of the textile factories where hand touch is common. This study result has similar findings with studies in Gondar and Tendaho by Tekle and Osman respectively. During the weekend time most of the workers

as member of the society, indulge in many social political and many other economical activities and become exhausted in working hours of Mondays and Tuesdays(13, 16 27).

Even though it is not statistically supported the number of Safety trainings and service years increases workers get protected from injury due to their experience and repeated training opportunities s they acquire during their stay. In our study 200 (60.4%) reported taking safety training and 334(98.8%) have supervision and 253 (74.9%) were satisfied with their job .This result was consistent with similar studies done in Gondar and Tendaho (13, 16). Sleep is an active, cyclic biological phenomenon necessary for survival. One of the most frequent sleep disorders is excessive daytime sleepiness which affects 4 to 12% of the general population. Sleep disorder study done in the same factory on 1999 revealed that 58% had sleep disorder and the cause was Shift work. Similarly our study revealed 43% were having the disorder due to 20(43.85) work overload and 16(3408%) night shift work respectively .Sleep disorders affects wakefulness ,concentration and ability to watch working environment carefully (20, 22, 31, 32).Although a alcohol consumption was not statistically associated with the prevalence of workplace injuries in our study, its consumption on weekends might contribute to this situation. According to studies done in eleven urban industries in Addis Ababa and textile factories, the highest work-related injuries occurred on Monday's (34).

10. Strengths and limitations of the study

10.1 Strength

1. Since there are few published studies on the prevalence and determinant of workplace injuries in Ethiopia, this study will provide some additional information to all stakeholders

2. Use of multiple data collection methods like physical examination, record review and work place observation using checklist to validate the self -reported information regarding work related injuries and work conditions.

3. One year cross-sectional study enables to see the overall magnitude of occupational injuries throughout all production seasons. This will clear the doubt wheatear there is seasonal association of workplace injuries.

10.2. Limitations

1. The study was a one -year cross -sectional study. The possibility of recall biases resulting in under or over reporting of events was likely.

2. During the last 2 years due to BPR 520 workers were driven out by the management body and this might have contributed for the low prevalence of workplace injuries (healthy worker survivor effect).

3-Down-time because of electric power interruption (60 solid working days) was lost which Contributed to decrease workers exposure time.

4. Small sample size.

11 Conclusion and recommendations

11.1 Conclusion

- .In this study, the overall occupational injury prevalence rate of 139 per 1000 exposed workers per year is relatively low.
- Twenty-one (44.7%) injured respondents were hospitalized.
- There was no death during the study period.
- Consistent with other studies low income was associated workplace injuries.
- Workers in spinning and weaving were less likely to be injured
- A total of 659 working days were lost, making average working days lost per injured respondents, being 14 days.

11.2 Recommendations

For management body, safety committee and production workers

- Existing safety committee should be reorganized and due attention should be given to the preventive aspects of occupational health and workplace injuries
- At the time of employment everyone should get enough and appropriate health and safety training. Refresher courses and on job trainings should be arranged

- . Personal protective devices should be used regularly! There should be sustainable supply of devices.
- .First aid materials should be made available and everyone should have the basic skills how to use it
- Well organized, if possible, computerized injury record and follow up system should be designed so that information's will be readily available for planning and monitoring activities.
- Workers should not spend more than 48 hours per week at work

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Annex 1: English Version Questionnaire

Addis Continental Institute of Public health

Questionnaire for the assessment of occupational injuries in Bahir Dar Textile Factory, Bahir Dar

Identification

Name of the department _____

Name of the working section _____

INTRODUCTION AND CONSENT FORM

How are you? My name is _____. I came from Addis Continental Institute of Public Health to conduct study on the prevalence and determinants of workplace accidents in Bahir Dar Textile Factory. The results of this study will help the management body and the workers at large by reducing Workplace injuries and consequent economical losses. To conduct this study we have prepared a questionnaire and you will be asked to give answers for each question. The question will include incidents which resulted in injury to while at job you in the past 12 months. The whole process of this interview will not take us more 30 minutes

Whatever information you provided us will be kept. Confidential and in the course of the interview you have the right to decline to answer any question you don't like.

May I have your permission to continue, please?

1. I f yes, continue to the next page
2. If no, skip to the next participant by writing reasons for his/ her refusal

Informed consent Certified by

Interviewer: Code _____Name _____signature_____

Date of interview _____Time started _____Time completed_____

Result of interview: 1.Completed 2.Respondent not available 3.Refused 4. Partially completed

Checked by Supervisor: Name _____signature _____Date _____

Part I: Socio- demographic characteristics

No	Question	Possible response	Skipping	Code
101	Sex	1=Male 2=Female		
102	Age	----------Years		
103	Religion	1=Orthodox2=Muslim3=.Protestant 4=Catholic		
104	Ethnicity	1. Amhara .2 Tigrie 3. Oromo99- Other		
105	Educational level	1=Illiterate 2=Read and write 3=Primaryschool(1-8)4=Secondary(9-12) 5=Techniqueschool6=Tertiary(Diploma/degree		
106	Marital status	1.Married 2=Single 3=.Divorced/Separate 4.Widowe		
107	Residence	1.Urban 2.Rural		
108	Departmentofwork	1-Weaving ,2= Spinni3=-Finishing 4-Technique		
109	Total service year	_____Month/Year		
110	Service i theSame job	_____ Month/Year		
111	Monthly salary	_____birr		

Part II. Work related injury characteristics

No	Question	Possible response	Skipping	Code
201	Injury in the last 12 months?	1.Yes 2.No	If no, skip to Q 301	
202	Injury in 2weeks?	1. Yes 2.No		
203	How many times?	1. Once 2.more than once		
204	Parts of the body	1. Eyes 2.Upper arm 3. Lower arm		

	affected	. 4. Finger 5. Head 6. Upper leg 7. Lower leg 8. Tooth 9. Chest 10. Neck 11. Back 12. Knee 13. T14. Face 15. Multiple 99. Other, specify _____		
205	Type of injury.	1Abrasion 2. Cut 3. Burn 4. Puncture 5. Fracture 6. Dislocation 7. Eye injury 8Earinjury 9.Suffocation 10. Electrocution 11Amputation12. Poisoning		
206	What were you doing?	----------		
207	Causes of injury?	1. Machine 2. Hit by Falling objects 3. Electricity 4. Splintering objects5. Hand tools 6. Fire 7. Acids /hot substances 8. Falls 9. Collision with object10. Lifting heavy objects 11.Other, specify_____		
208	What was the reason given by the respondent or the causes of injury?	1. Absence of protective devices 2. Misuse of protective devices 3. Disorder of normal operation 4. Absence of safety education 5. Improper hand working Instruments 6. Absence/inadequate machine safe guards99.Other, specify __		
209	Day of injury	1. Monday 2.Tuesday 3 .Wednesday 4. Thursday 5. Friday 6. Saturday 7. Su22. Do not remember		
210	Time of injury	1 morning 2. Afternoon 3 evening 4. mid-night 22 .Do not remember		
211	Wereyouhospitalized?	1. Yes 2. No		
212	If yes for how long?	_____ Days		
213	working days lost	_____ days		

Part III. Working Environment Information

301	Hours worked per week	_____ h		
302	Are work places supervised regularly?	1. Yes 2. No		
303	Occupational safety Training ?	1. Yes 2. No		
304	How long since last training	…….days/month/years		

IV Part. Worker's Behavior Information

401	Do you drink alcohol?	1. Yes 2.No	If no, skip to Q403	
402	If yes to Q401, how often?	1. Every day 1-3 . Occasionally	if no, skip to Q405	
403	Do you chew chat?	1. Yes 2.No	If no, skip to Q407	
404	If yes to Q403, how often?	1 Everyday 2. 1-3 days / wee 3. Occasionally	If no, skip to Q409	
405	Do you smoke cigarette?	1. Yes 2. No	If no, skip to Q412	
406	If yes to Q405, how often?	1 Every day 2. 1-3 days week 3. Occasionally		
407	Doyouhave sleeping disorders?	1. Yes 2. No		
408	What is the reason for this sleeping disorder?	1 Working more than 8 hrs/day in theenterprise 2/Engage in additional dutiesoutsidetheenterprise3/.Evening/Mid-nightworking time 4. Work burden99. Other		
409	Ar you satisfied with your job?	1. Yes 2. No		
410	Do you use PPD?	1. Yes 2. No		
411	If yes to Q410, what type?	1.Gloves 2.Respirators 3.Goggles 4. Face shield 5.Boots 6.Ear plug . 7. Helmet 99. Other,		

Annex 2: Amharic Version Questionnaire

አዲስ ኮንቲነንታል የህብረተሠብ ጤና ሳይንስ ኢንስቲቲዩት

በባህር ዳር ጨርቃጨርቅ ፋብሪካ ውስጥ በሚሰሩ ሰራተኞች ላይ ስለሚደርስ የስራ ላይ አደጋና ምክንያቶች ለማወቅ የተዘጋጀ ጥናት፡የመጠየቅ ቅፅ መለያ ቁጥር.....የስራ ክፍል 1/ ፈትል 2/ ሽመና 3/ ማጠናቀቂያ 4/ ቴክኒክ

ቃለመጠየቅ ከመደረጉ በፊት የተሳታፊዎች ስምምነት መጠየቂያ ቅፅ

ጤና ይስጥልኝ ! እኔ..... እባላለሁ የመጣሁት ከአዲስ ኮንቲነንታል ጤና ሳይንስ ኢኒስቲቲዩት ሲሆን በዚህ በባህር ዳር ጨርቃጨርቅ ፍብሪካ ውስጥ በስራ ላይ ስለሚደርሱ ጉዳቶችና ምክንያቶቻቸው ለማጥናት ነው።ይህ ጥናት ሲጠናቀቅ ውጤቱ ለመላው ሰራተኛና ለፋብሪካው አስተዳደር የስራ ቦታ አደጋንና ተያያዥ ችግሮችን ለመቅረፍ እገዛ ያደረጋል።እርሰዎም የዚህ ጥናት ተሳታፊ በመሆን ለሚቀርብለዎት ጥቃቄዎች መልስ እንዲሰጡን ስንጠይቅ የሚወሰድብን ጊዜ ከ3 0 ደቂቃ እንደማይበልጥና ማንኛውም መልስዎ በሚሰጥር የሚጠበቅ መሆኑን እንገልፃለን። ከዚህ በተጨማሪ ለመመለስ ፈቃደኛ ያለሆኑትን ጥያቄ የመመለስ ግዴታ የለብዎትም።ከላይ በተገለፀው መሠረ በጥናት ለመሣተፍ ፈቃደኛ ነወት ? 1/ አዎ ..... ወደሚቀጥለው ይሸጋገሩ 2/ የለም ..... ፍቃደኛ ያልሆኑበትን ምክንያት በመግለፅ ወደ ሚቀጥለው ተጠያቂይሸጋገሩ፡

ፍቃደኛነቱንያረጋገጠው...የጠያቂውመለያቁጥስም.....ፊርማ.....

መጠየቁየተሞላበትቀን.....ተጀመረበትሰዓት.....የተጠናቀቀበትሰዓት.....የመጠየቁ ውጤት 1/ ተጠናቋል 2/ ተጠያቂው አልተገኙም 3/ ተጠያቂው ተቃውሚል 4/

ክፍል አንድ /ማህበራዊና ስነ ህዝባዊ ባህሪያት				
ተ/ቁ	ጥያቄ	አማራጭ መልሶች	መሻጋገሪያ	ኮድ
101	ዕታ	1/ ሴት 2/ ወንድ		
102	ዕድሜ	ዓመት		
103	ሐይማኖ ት	1/ አርቶዶክስ 2/ ሙስሊም 3/ ፕሮቴስታንት 4/ ካቶሊክ 5/ ሌሎች		
104	ብሔረሰብ	1/ አማራ 2/ ትግሬ 3/ ኦሮሞ 4 ሌሎች		
105	የትምህርት ደረጃ	1/ ማንበብና መፃፍ የማይችል 2/ ማንበበና መፃፍ የሚችል 3/ መጀመሪያ ደረጃ (4-8)/ ሁለተኛ ደረጃ (9-12)5/ ቴክኒክ 6/ ኮሌጅ ዲፕሎማ (ዲግሪ)		
106	የጋብቻ ሁኔታ	1/ ያገባች 2/ ያላገባች 3/ የፈታች/የተለያየች/ የሞተባት/በት		
107	የመኖሪያ ቦታ	1/ ከተማ 2/ ገጠር		
108	የስራ ክፍል	1/ፈትል 2/ሽመና 3/ማጠናቀቂያ 4/.		

		ቴክኒክ		
109	በዚህ ፋብሪካ ለምን ያህል አገለግሉ?	.....ወር/ዓመት		
110	በዚህ ሙያ ለምን ያህል ጊዜ አገለግሉ ?	.....ወር/ዓመት		
111	የወር ደመወዝ	.....ብር		
201	ባለፉት 12 ወራት ከስራ ጋር በተያያዘ ደረሰበዎት ጉዳት አለ ?	.1/አዎ 2/ የለም	የለምከሆነወ ደቁጥር 301 ይሸጋገሩ	
202	ባለፉትሁለትዓምንታትከስራጋር የተያያዘየደረሰበዎት ጉዳት አለ?	1.አዎ 2/ የለም		
203	በላይለተራ ቁጥር 201 እና 202 ወይም ከሁለት ለአንዱ መልስዎ አዎ ከሆነምንያህል ጊዜ ?	1/አንድጊዜ 2.ከአንድጊዜ በላይ		
204	በአደጋው በተጎዳው የሠውነት ክፍል	1/ አይን 2/ ከክርን በላይ 3/ከክርንበታች 4/ የእጅ እጣት 5/ ጭንቅላት /ራስ 6/ ከጉልበትበላይ 7/ ከጉልበትበታች 8/ጥርስ 9/ ደረት 10/ አንገት 11/ ጀርባ 12/ ጉልበት 13/የእግር እጣት 14/ፊት 15/ከአንድ በላይ የአካል ክፍል 16/ሌሎች		
205	የጉዳቱ አይነት	1/ጭርት 2/መቆረጥ 3/ ቃጠሎ 4/ መወጋት 5/ ስብራት 6/ወለምታ 7/ ዓይን ላይ የደረሰ ጉዳት 8/ ጀሮ ላይ የደረሰ ጉዳት 9/መታፈን 10/ኤሌክትሪክመያዝ 11/የአካልመጉደል 12/መመረዝ 13/ ሌላ ካለ ይጠቀስ		
206	ጉዳቱ በደረሰ ጊዜ ምን ይሰሩ ነበር	.....		
207	የጉዳቱ ምክንያት	1/ማሽን 2/በሚወድቅእቃመመታት 3/ኤሌክትሪክ 4/በተፈናጣሪ መመታት 5/ የእጅ መሣሪያ አደጋ 6/ እሳት 7/ ኬሚካልና ትኩስ ነገር 8/ ግጭት 9/ መውደቅ 10/ ከባድ እቃ ማንሣት 11/ ሌሎች ካሉ ይጠይቁ		
208	የጉዳቱ መንስኤ	1/መከላከያ መሣሪያ አለመኖር 2/መከላከያመሣሪያበአግባቡአለመጠቀም		

		3/የመሣሪያውእኩልመግጠም 4/የጥንቃቄትምህርትአለመኖር 5/መሣሪያወችንበአግባቡ አለመያዝ 6/ የማሽኖች መከላከል በቂ አለመሆን		
209	አደጋው የደረሰበት እለት	1/ ሠኞ 2/ ማክሰኞ 3/ ረቡዕ 4/ ሐሙስ 5/ አርብ 6/ ቅዳሜ 7/ እሁድ		
210	አደጋው የደረሰበትሰዓት	1/ ጠዋት 2/ ከሰዓት 3/ ማታ 4/ ሌሊት 5/ አላስታውስም		
211	በደረሰበዎት ጉዳት ምክንያት ጤና ተቋም ተኝተው ታክመዋል?	1/ አዎ 2/ የለም		
212	አዎ ከሆነ ለምን ያህል ጊዜ ?	1/ 24 ሰዓትና በታች 2/ ከ 24 ሰዓት በላይ		
213	ከስራ ጋር በተያያዙ ጉዳቶች ምክንያት ባለፍት 12 ወራት ውስጥ በስራ የቀሩበት ቅናት ብዛት?	……		
ክፍል ሶስት ሥራና የስራ ቦታን በተመለከ t				
301	በሳምንት ስንት ሰዓት ይሰራሉ?	----------ሰዓት		
302	የስራቦታቁጥጥር ተደርጎ ያውቃል ?	1/ አዎ 2/ የለም		
303	የሙያ ደህንነት ስልጠና ወስደው ያውቃሉ?	1/አዎ 2/ የለም		
304	ስልጠና ከወሰዱ ምን ያህል ጊዜ ሆኖዎታል ?	---------ወራት-------አመት		
ክፍል አራት የሰራተኛውን ባህሪ በተመለከተ				
401	አልኮል መጠጥ ይጠጣሉ?	1/ አዎ 2/ የለም		
402	Ki 99 የሚጠጡ ከሆነ ስንት ጊዜ?	1/በየቀኑ 2/በሳምንትከ 1-3 ቀናት 3/ አልፎ አልፎ		
403	ጫት ይቅማሉ ?	1/ አዎ 2/ የለም		
404	የሚቅሙ ከሆነ ስንት ጊዜ?	1/ በየቀኑ 2/በሳምንት ከ 1-3 ቀናት 3/ አልፎ አልፎ		
405	ሲጋራ ያጨሳሉ?	1/ አዎ 2/ የለም		
406	የሚያጨሱ ከሆነ ስንት ጊዜ?	1/ በየቀን / በሳምንትከ 1-3 ቀናት 3/ አልፎ አልፎ		
407	የእንቅልፍ ችግር አለብዎ ?	1/ አዎ 2/ የለም		
408	ካለብዎ ምክንያቱ ምን ይመስለዋታል ?	1/ በፋብሪካው ውስጥ ከ 8 ሰዓት በላይ መስራት 2/ከስራሰዓትውጭ ተደራራቢ ሐላፊነቶች መኖር		

		3/ የማታ/ የሌሊት ፈቃድ ሥራ 4/ የስራ ጫና ሌሎች ካሉ ይገለፁ		
409	በስራዎ ደስተኛ ነዎት ?	1/ አዎ 2/ የለም		
410	በስራ ቦታዎ የጉዳት መከላከያ ተጠቅመው ያውቃሉ?	1/ አዎ 2/ የለም		
411	ተጠቅመው ከሆነ የትኞችን	1/ [1] ንት 2/ የአፍንጫና የአፍ መተንፈ a 3/ የአይን መነፀር 4/ የፊት ሽፋን 5/ ቦ t ጫማ 6/ የጀሮ መከላከያ 7/ የጭንቅላት መከላከያ		
412	የማይጠቀሙ ከሆነ ምክንያቱ ምንድን ነው ?	1/ የመከላከያ መሣሪያዎች ባለመሆራቸው 2/ ለአጠቃቀም ምቹ ስላልሁኑ 3/ የደህንነትና ጤና ትምህርት ስለማይሰጥ 4/ የሥራ ስልጠትን ስለሚቀንስ 5/ የደህንነትና የጤና ጠንቅ ስለሚያስከትል ሌላ ካለ ይጠቀስ		

- ጥያቄዎችን ጨርሰናል ስላደረጉልን ትብብር እናመሰግናለን።

Declaration

I, the undersigned declare that this thesis is my original work in partial fulfillment of the requirement for the degree of Master of Public Health. I also declare that it has never been presented in this or any other university and that all resources and Materials used in the thesis have been duly acknowledged.

Student Name: ----------

Signature: ----------

Place of submission: ----------

This thesis has been submitted for examination with my approval as a university advisor.

Name of advisor: ----------

Signature: ----------

Date of submission: ----------